

ABSTRACT OF THE DISCLOSURE

A Machine for Production of Granular Silicon which provides a fluidized bed reactor with one or more stages each stage having a heating section located below a reacting section and a mechanism that pulses granules back and forth between the heating and reacting sections, separate cooled injectors for silicon containing gases and uncooled injectors for non silicon containing gases, heaters to heat the non silicon containing gases above the reaction temperature and the silicon containing gases to a temperature just below their decomposition temperature. In the preferred embodiment the heater for the silicon containing gases controls the condensing vapor of a heat transfer fluid to a temperature below the decomposition temperature of the silicon containing gases. The preferred design for cooling the injectors uses a water-cooled microchannel design, which minimizes parasitic heat losses. A further preferred feature is the use of an enclosed noncontaminating sieving device to selectively remove product and recycle undersize material. An additional feature are the use of a weigh cell with frequency analysis capability to provide information on the weight of the reactor and the force exerted by the pulsing action of the granules.

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